

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|---|--|--|
| Applicant's or agent's file reference CISCP329.WO | FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, Item 5 below. | |
| International application No. PCT/US2004/019617 | International filing date (day/month/year) 18/06/2004 | (Earliest) Priority Date (day/month/year) 31/07/2003 |
| Applicant CISCO TECHNOLOGY, INC. | | |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. i.

2. ☐ Certain claims were found unsearchable (See Box II).**3. ☐ Unity of invention is lacking (see Box III).****4. With regard to the title,**

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regards to the drawings,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 4

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L12/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|--|
| Y | US 6 397 260 B1 (HISCOCK JAMES SCOTT ET AL) 28 May 2002 (2002-05-28) column 6, line 21 - column 7, line 44; figure 3 | 1-3,5, 7-13, 15-18, 22-24, 28-32, 36-42 |
| Y | US 6 295 276 B1 (BHASKAR RAGULA ET AL) 25 September 2001 (2001-09-25) column 5, line 54 - column 8, line 67; figure 2 column 15, lines 16-51 | 1-3,5, 7-13, 15-18, 22-24, 28-32, 36-42 |
| | -/- | |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *I* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

Z document member of the same patent family

Date of the actual completion of the international search

30 September 2004

Date of mailing of the international search report

07/10/2004

Name and mailing address of the ISA

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Kreppe1, J

| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|---|--|
| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| Y | US 2003/037165 A1 (SHINOMIYA DAISUKE) 20 February 2003 (2003-02-20) paragraph '0015! paragraphs '0147! - '0178! ----- | 1-3,5, 7-13, 15-18, 22-24, 28-32, 36-42 |
| A | US 5 473 599 A (COLE BRUCE A ET AL) 5 December 1995 (1995-12-05) column 6, line 27 - column 7, line 29; figure 2a column 15, lines 30-48 ----- | 1-43 |

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US2004/019617

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---|
| US 6397260 | B1 | 28-05-2002 | NONE |
| US 6295276 | B1 | 25-09-2001 | US 2003031180 A1 13-02-2003 US 6493341 B1 10-12-2002 |
| US 2003037165 | A1 | 20-02-2003 | JP 2003023444 A 24-01-2003 |
| US 5473599 | A | 05-12-1995 | AU 2359995 A 16-11-1995 WO 9529544 A1 02-11-1995 |

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/019617

International filing date (day/month/year)
18.06.2004

Priority date (day/month/year)
31.07.2003

International Patent Classification (IPC) or both national classification and IPC
H04L12/56

Applicant
CISCO TECHNOLOGY, INC.

BEYER WEAVER & THOMAS, LLP

ATTY: JKW ASSOC.: JMW

ACTION: Rep to Written Op

DUE DATES: 1/7/05

DOCKETED: 10/22 BY: CN

DOCKET NO.: CISCP329W0

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/019617

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/019617

Box No. II Priority

1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------------------------------------|
| Novelty (N) | Yes: Claims | 1-43 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 4,6,14,19-21,25-27,33-35,43 |
| | No: Claims | 1-3,5,7-13,15-18,22-24,28-32,36-42 |
| Industrial applicability (IA) | Yes: Claims | 1-43 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1 Re Item V.

1.1 The following documents are referred to in this communication:

- D1: US-B-6 397 2601 (HISCOCK JAMES SCOTT ET AL) 28 May 2002 (2002-05-28)
D2: US-B-6 295 2761 (BHASKAR RAGULA ET AL) 25 September 2001 (2001-09-25)

1.2 Document D1 discloses, according to features of **claim 1**, a method controlling the distribution of traffic flow in a load-sharing redundancy group comprising a first gateway device and a second gateway device configured to forward packets sent from hosts (*Fig. 3; col. 6, lines 21-32*), comprising:

- assigning a first plurality of forwarding addresses to the first gateway device (*Fig. 3: R1, MAC-MB, MAC-MA*);
- assigning a second plurality of forwarding addresses to the second gateway device (*Fig. 3: R2, MAC-MB, MAC-MA*);
- distributing the forwarding addresses to hosts to use in sending packets to the redundancy group (*col. 7, lines 8-26*);
- the hosts sending packets using the distributed forwarding addresses (*col. 7, lines 27-44*);

The method defined by **claim 1** differs from that known method in that the traffic flows can be adjusted by measuring flows and comparing it to a target. The distribution of load can thus be dynamically changed.

However, these features have already been employed for the same purpose in a similar method, see document **D2**, *col. 15, lines 16 to 51*. It would be obvious to the person skilled in the art, namely when the same result is to be achieved, i.e. dynamically change the load distribution, to apply these features with corresponding effect to a method according to document **D1**, thereby arriving at a method according to **claim 1**.

Hence, no inventive step is present in the subject-matter of **claim 1** (Article 33(3) PCT).

- 1.3 Independent **claim 10** relates to a method comprising substantially the same features as the method defined by **claim 1**. Independent **claims 15, 24, 30 and 39** relate to respective devices implementing the method defined by **claims 1 and 10** and having corresponding apparatus features. Hence, the subject-matter of **claims 10, 15, 24, 30 and 39** is also not based on an inventive step (Article 33(3) PCT).
- 1.4 Dependent **claims 2, 3, 5, 7-9, 11-13, 16-18, 22-23, 28, 29, 31, 32, 36, 37, 38, 40-42** do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step because their features are either directly derivable from the prior art (**D1, D2**; see the international search report) or represent merely obvious design options.
- 1.5 The subject-matter of dependent **claims 4, 6, 14, 19-21, 25-27, 33-35 and 43** is not rendered obvious by the prior art. Load distribution is done using a hash of the source MAC address according to **D1**. Document **D2** does not disclose any details of the load distribution algorithm. The load distribution according to **claims 4, 6, 14, 19-21, 25-27, 33-35 and 43** based on forwarding addresses flexibly assigned to routers provides an advantage in that a changed load distribution becomes immediately effective because packets addressed to the MAC addresses cached by clients will automatically be diverted to the router to which the address has been newly assigned. According to **D1**, the router is determined when responding to an ARP request. Cached MAC addresses will thus always be routed to the same router even after changing the load distribution (e.g. according to **D2**), i.e. changes become effective only when the cache is refreshed by a new ARP request.

The subject-matter of **claims 4, 6, 14, 19-21, 25-27, 33-35 and 43** therefore meets the requirements of Articles 33(2) and (3) PCT with regard to novelty and inventive step.

2 Re Item VII.

- 2.1 Independent **claims 1, 10, 15, 24, 30 and 39** are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document **D1**: see the comments and citations in **Item V**) being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- 2.2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

3 Re Item VIII.

- 3.1 It is clear from the description and the drawings that the following features are essential to the definition of the claimed invention:

a forwarding address is re-assigned to a different gateway device so as to adjust the traffic flow

No alternative has been disclosed for the step of adjusting. The load balancing scheme of the claimed invention is entirely based on the assignment of forwarding addresses to gateways. An adjustment of the load distribution can thus only be achieved by changing the address assignment.

Since independent **claims 1, 10, 15, 24, 30 and 39** do not contain this feature they do not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

Note: the formulation "*adjust the measured traffic flow using one of the forwarding addresses*" does also not clearly differentiate the claimed method against the prior art. The load balancing method disclosed in **D2** does also "use" the MAC addresses of the routers in ARP responses so as to balance the load between the routers based on measurements of the current load.

- 3.2 Although method **claims 1 and 10** and apparatus **claims 15, 24, 30 and 39** have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.
- 3.3 The vague and imprecise statement in the description on page 21 (last two lines: *"full scope of equivalents whether foreseeable or unforeseeable now or in the future"*) implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.